

DISASTER PLANNING:
PREPARING FOR THE “EL NINO” DISASTER

Executive Analysis of Fire Service
Operations in Emergency Management

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ABSTRACT

The City of Los Angeles and much of California, Arizona, and Nevada are being warned by weather forecasters that they can expect El Nino to create the most severe wet winter conditions in their area in decades. Disaster management is a very real part of the fire service, since disasters are a very real part of its history. When people and property are not directly effected very little publicity and attention is given to such non-damaging incidents. However, when people and property are effected, the particular incident suddenly becomes a “headline newspaper incident.”

When a disaster occurs, no single agency has the total resources to cope with the enormity of the problem. The cornerstone of any emergency service following a disaster is the availability and adequacy of resources, mutual aid, efficient and effective co-ordination, and inter and intra-agency cooperation. In isolation all emergency services are geared to effectively handle their particular area of responsibility, however following a disaster, many factors can impact on any and all functions of emergency services. While emergency services generally “expect the unexpected” during response, when dealing with disaster situations, the attitude, response approach and actions must be focused for the worst case scenario.

Local, State and Federal disaster management plans are in place to cope with anticipated disasters. All agencies are an integral part of these plans and each of the participating agencies has documented responsibilities. While it is not possible to produce a “standard” definite operational plan for all agencies, this research project focuses on disaster resistance, response, and recovery. This is because during major disasters, the very function or availability of

emergency services will be anything but “standard.” This study employed a combination of evaluative and action research methodology to ensure the Los Angeles City Fire Department is totally prepared for El Nino 1997.

The research question to be answered were:

- 1) What can be expected in an El Nino?
- 2) What “risks” must the City of Los Angeles include in its damage assessment?
- 3) What steps can be taken to prepare for “resistance” to this disaster?
- 4) What measures need to be employed to “respond” to mitigate this disaster?
- 5) What “recovery” procedures need to be adopted?

Over the 100-year history of the Los Angeles City Fire Department, there have been many disasters that have faced this department. They include: earthquakes, floods, riots, wildland fires, tornadoes, and now El Nino. Because no one knows what will happen during the coming storm season, the department must continue to dedicate its resources and personnel to prepare for the upcoming storm season and work with cities, the media, and the public to provide for the health and safety of the public. Disaster management must include all components; these are risk, resistance, response, recovery, and restoration.

The findings of this research indicated that throughout the Los Angeles area agencies have worked hard to maintain a high level of interdepartmental cooperation. There formalized mutual aid agreements and joint swiftwater rescue programs provide for a quick and efficient

means to mitigate incidents synergistically. Recommendations from this study illustrated that through the addition of damage assessment and risk management prevention programs, utilizing computer and historical data, flood inundation areas can be identified and pre-water planning implemented. In anticipation of a severe storm season, community preparation has become a top priority. These programs include community awareness, community emergency response team training, erosion control, media advisories, and weather forecast monitoring. Continued inter and intra-agency disaster cooperation has proven itself to be a vital link in the recovery aspects of a City prone to disasters.

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INTRODUCTION

Since the early 1900's, there have been significant flooding disasters and concomitant damage to the City of Los Angeles. The storm of 1969, caused the flood control system to reach 80% of its capacity. During the 1980 storm, the waters in the flood control system reached 100% capacity. This means there is no alternative plan to manage and store floodwaters. Thus, flood waters overflow dams, rivers, and flood control systems. During the monster storm "El Nino 1982-83", again a 100% capacity storm, wide spread disaster caused the destruction of two hundred and fifty-six homes, hundreds of associated disaster injuries, and thirty-three reported deaths. Worldwide this storm resulted in fifteen hundred deaths and eight billion dollars in property damage.

In the winters of 1992 and 1993 Los Angeles experienced a series of storms causing extensive property damage, personal injuries and deaths. These two storms created the worst flooding to the City in over 50 years. Water in one dam, the Sepulveda Dam, was observed to rise twenty feet within two to three hours. The City's sewer system was severely overloaded and resulted in the release of millions of gallons of raw sewage. This required the closure of the entire seventy-six miles of the Los Angeles County coastline. The saturated soil conditions resulted in frequent landslides and mudslides, which destroyed numerous hillside roadways and residences.

Scientists have predicted the return of El Nino this winter and state it could have the same impact on the City of Los Angeles as it did in 1982-83. Due to this potential for enormous citywide damage, it is important to prepare in advance, respond quickly and effectively as

possible, and have recovery procedures in place to reduce the impact from direct and indirect losses. Therefore, the City of Los Angeles has revisited its Emergency Operations Master Plan Storm Annex. This Storm Annex addresses each agencies responsibilities before, during, and after a storm. These categories have been titled: risk identification, resistance to disaster, response measures, and recovery procedures.

Local, State, and Federal disaster management plans are in place to cope with anticipated disasters. All agencies involved in the City's Storm Annex Master Plan are an integral part of these plans and each of the participating agencies have documented disaster responsibilities. This study employed a combination of evaluative and action research methodology to ensure the Los Angeles City Fire Department is totally prepared for El Nino 1997. This was accomplished through analysis of historical disaster data and statistical documentation, risk management prevention programs, computer assisted disaster programs, identification of current services provided, evaluation of additional services that need to be added, incident management of flood and moving water procedures, and effective procedures to aid in disaster recovery. The research question to be answered were:

- 1) What can be expected in an El Nino?
- 2) What "risks" must the City of Los Angeles include in its damage assessment?
- 3) What steps can be taken to prepare for "resistance" to this disaster?
- 4) What measures need to be employed to "respond" to mitigate this disaster?
- 5) What "recovery" procedures need to be adopted?

The Los Angeles City Fire Department (LAFD) will be a major player during disaster situations. All fire and rescue agencies provide a variety of service delivery programs, equipment, resources, and staffing. They are geared towards providing 24 hour, 7 days a week, 365 days a year of full service. Therefore, fire and rescue agencies will be the “vanguard” of rescue and damage control in all disasters. This will continue until such time as kindred organizations and volunteer groups can mobilize themselves.

BACKGROUND AND SIGNIFICANCE

On August 21, 1997, the City of Los Angeles’ Mayor, Richard J. Riordan, requested that all City department heads contact and coordinate with the City Administrative Office Emergency Preparedness Division to ensure their department’s readiness for the 1997-98 storm season. This request for City readiness was partially due to the heightened reports of a developing El Nino condition, which could result in increased rain and storm related activity.

The City of Los Angeles encompasses 465 square miles with an approximate population of 4.2 million. The terrain within the City is quite varied including mountains, coastal plains, valleys, and urban development. Elevations range from sea level to approximately seven thousand feet.

The flood control system within the City is an element of the Department of Public Works and the United States Army Corps of Engineers. They are tasked with the management, storage, and conveyance of water within the flood control system. The City of Los Angeles is

served by one of the largest flood control systems in the world. This system of reservoirs and flood control basins reduce peak runoff from mountainous areas and convey these water flows into a network of above ground channels and underground storm drains. This vast intricate system is responsible for draining the urban areas of the City from floodwaters. Pump stations lift flood waters in low-lying areas into the major channel system of the Los Angeles River. This system was constructed in the 1930's and 1940's. The United States Army Corps of Engineers has estimated the construction of this flood control system has saved the County of Los Angeles \$3.6 billion in flood damages.

The Los Angeles Flood Control System is comprised of three major waterways: Los Angeles, Rio Hondo, and San Gabriel Rivers. This system consists of over 450 miles of flood control channels and over 2,000 miles of storm drains. These channels range in size from 2' to 600' in width, 2' to 40' in depth, and reach velocities well over 35 miles per hour (Seidel,1994,p.104). The current path of water flow within the City was established in 1862. From this current path of water flow came the design and construction of today's flood control system (Attachment A).

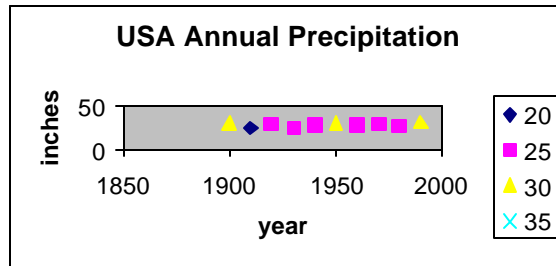
Rivers and streams have been flooding as long as water has flowed on the earth. Webster defines a flood as a body of water, which covers land that is usually not under water. It may destroy property, homes, industries, businesses, and even carry off the rich topsoil, leaving the land barren. When Cities are not prepared, sudden and violent floods may bring about disastrous results. Floods can originate from rivers, lakes, and the ocean. History has shown

that river floods are the primary cause of flooding. Floods from lakes usually occur from dam failure or overflowing from river inlets being flooded. High tides, severe winds, and occasionally tidal waves or tsunamis usually cause Ocean flooding.

Nature provided one of the best ways of controlling floods in the grasses, trees, and other vegetation which grow on high lands where floods start. Each blade of grass holds some of the heavy rain that falls on the land, or melts from the winter's snow. The natural mountain soil environment of dirt and rocks allow the rainfall to percolate into the ground. As mentioned in a previous research project on Mutual Aid in the Swift Water Rescue Arena, Swift Water Rescue "Large scale development that has occurred in the Los Angeles basin has greatly impacted the flood control system. First, it creates areas where water accumulates on top of an impervious surface and cannot percolate into the ground. Examples of this are streets, freeways, parking lots, and building structures. Second, these surfaces allow water to runoff at greater speeds." (Reyes,1995)

One incident that occurred in California resulted in reducing losses in high-risk flood hazard areas. Since this incident regulations of dams and inspection cycles have been instituted. On March 12, 1928, at three minutes to midnight, in San Francisquito Canyon, California, the 208' high, 700' wide St. Francis Dam that was responsible for controlling over 138,000 acre-feet of water failed. This flood was responsible for killing more than 400 people as it continued down the Santa Clara Valley to the Pacific Ocean south of Ventura, California. This path of disaster covered an area of approximately 54 miles. The dam, which was owned and operated by the Los Angeles City Department of Water and Power was only 22 months old when it failed. Investigators said the rocks along the canyon walls were not strong enough to support it.

In planning for flood protection, hydrologists and engineers describe floods in frequency of occurrence: 10-year floods, 50-year floods, 100-year floods, and 500-year floods. This is a way of assessing the odds of water reaching peak capacities in rivers or flood control systems. Flood planning prediction is based on United States precipitation averages, as illustrated below.



The above chart depicts an average of 25 inches of annual rainfall in the United States. Communities must prepare for the proper flood protection through their expected rainfall annually, as well as unanticipated flood disasters. Therefore, a 100-year flood describes water levels that should occur once a century. However, having 100-year floods in back to back years or not having a 100-year flood for two centuries does not mean nature is up to something strange. The best way to describe flood prediction is to say a 100-year flood has a 1% chance of occurring in any given year (Attachment B).

In the Executive Analysis of Fire Service Operations in Emergency Management Course it was demonstrated that proper mitigation of disasters is dependent upon a “holistic” approach. Emergency service agencies and the community must work together synergistically, towards a common vision. This shared vision includes all aspects of disaster management, risk, resistance, response, recovery, and restoration.

LITERATURE REVIEW

The purpose of this literature review was to establish a foundation for this research paper by utilizing information and articles relating to analysis of risks, resistance, response, and recovery in disaster master planning. This literature review reinforces the results and recommendations in emergency preparation, disaster declaration, response resource allocations, intra and inter-agency cooperation, and development of a virtual disaster corporation.

In an innovative approach to swift water rescues, Larry Collins (1994,pp.62-65) describes the history of flooding within Los Angeles County. He discusses the need to provide community awareness to the community in storm education. This further led to the need to develop an interagency committee to address swift water preparedness and response strategies.

John Erickson, in his book on Marine Geology (1996), discusses the ocean currents, weather patterns, and climate changes surrounding the El Nino Southern Oscillation (ENSO). He states that about every three to seven years anomalous atmospheric pressure changes occur in the South Pacific Ocean. These pressure changes create a massive seesaw effect disrupting the westward flowing trade winds, warming the ocean temperature on the western pacific, and forcing the winds to flow back towards the east. This causes a major disruption in global weather patterns responsible for heavy rainfall along the equatorial western pacific coastline.

In a book titled “Flood-Proofing Non-Residential Structures” produced by the Federal Emergency Management Agency (1986), techniques utilized to reduce flood damages to existing or proposed non-residential structures are presented. Topics of discussion in this manual include emergency flood-proofing techniques, social-economical and physical factors that influence

floodproofing structures, sources of information and technical assistance, conceptual design of appropriate flood-proofing methods, cost factors, and case history studies. Also discussed is the need to utilize flood insurance maps to translate flood depths, flood elevations, with river/stream profiles.

The Guide for All-Hazard Emergency Operations Planning (1996), written by the Federal Emergency Management Agency describes the need to develop partnerships and work towards a national emergency management system that is comprehensive, risk-based, and all-hazard in its approach. This guide discusses organizational responsibilities for consideration of an emergency operations plan, how to develop and implement the plan, description of core functions, as well as specific disaster annexes. The guide is a “toolbox” of ideas and advice of what a community needs to do to protect itself from hazards that may arise out of a disaster. This guide utilizes principles from the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

Building a disaster resistant community is discussed in Project Impact (1997), where the Federal Emergency Management Agency discusses that communities must take the responsibility for alleviating the impact of disasters. The goal of Project Impact is to bring communities together to take actions that prepare for and protect themselves against natural disasters in a collaborative effort. To accomplish this goal there are four pre-disaster activity phases: building community partnerships, identifying hazards and community vulnerability, prioritizing hazard risk reduction actions, and communicating success.

The Federal Emergency Management Agency also discusses Reducing Losses in High Risk Flood Hazard Areas: A Guidebook for Local Officials (1987). In this guidebook a discussion of high-risk areas that include alluvial fans, inadequate levees, unsafe dams, coastal

flooding, erosion, flash flooding, fluctuating lake levels, liquefaction, ice jams, and mudslides. This publication indicates that the implementation of floodplain management criteria along with the National Flood Insurance Program can have a drastic impact on reducing flood damages. Each of the aforementioned high-risk areas is evaluated as to there hazard, existing mitigation efforts, options for community action, and is followed by regulatory excerpts.

In the article “A Framework for Risk Management” (Froot,et.al.,1994,pp.91-102) an argument is presented that managers must be allowed to build the framework needed in developing a coherent risk management strategy. He further discusses that the risk management paradigm rests on three basic principles: create a corporate value, which relates to disaster planning; make good investments, which translates to cooperation, education, and awareness; and, generate a positive cash flow, which is related to effective and efficient response and recovery strategies. Mr. Froot, recites a story in the Old Testament that tells of the Egyptian Pharaoh who dreamed that seven healthy cattle were devoured by seven sickly cattle and that seven healthy ears of corn were devoured by seven sickly ears of corn. Puzzled by this dream, the Pharaoh called upon Joseph to interpret it. According to Joseph, the dream foretold seven years of plenty followed by seven years of famine. To hedge against that risk, the Pharaoh bought and stored large quantities of corn. Egypt prospered during the famine, Joseph became the second most powerful man in Egypt, the Hebrews followed him there, and the rest is history. This analogy demonstrates that risk is often tied to need. The Pharaoh needed a wholesome community, the farmer needed to sell his crops, and the customer needed food. Therefore, management must assess the needs-benefit relationship in community based emergency disaster management.

Don Groves, in a book of questions and answers titled “The Ocean” (1989) discusses that at unpredictable yearly intervals, an abnormally warm ocean current appears off the coast of Ecuador and Peru around Christmas time. This El Nino (Spanish for “child”) current replaces the colder water with warmer water rich in nutrients and fish life. The result is radical changes in the ecosystems. In 1982-83, El Nino caused wholesale destruction of fish and seabirds, as well as major flooding resulting in loss of lives and property damage.

The Los Angeles City Emergency Operations Organization of Emergency Operations Master Plan and Operations for Storm Annex (1993), advises that Los Angeles continues to face a variety of threats, both natural and technological. Within the last ten years flooding and winter storms in the Los Angeles area have caused more dollar damage than its number one natural disaster, earthquakes. The Mayor of Los Angeles states the mission of the storm annex is the protection of life and property. To ensure this mission is met each participating agency has a responsibility for emergency risk analysis, resistance planning, response measures, and recovery efforts. These responsibilities are further separated into direction and control, declaration of emergency, city resources, intergovernmental cooperation, and community and business liaison. This chart describes the distribution of responsibilities:

STORM ANNEX ISSUE	DEPARTMENT RESPONSIBLE
Storm Annex	Emergency Management Committee
Closure/Evacuation Procedures for at risk areas	Police
Swift Water Rescue Program	Fire
Traffic Routing and Transportation	Transportation
Storm Drains	Public Works
Animal Control and Care	Animal Regulations
Public Shelters	Recreation and Parks

Sand Bag Distribution to the Public	Fire
Emergency supplies needs of EOO Responders	General Services
Coordination with L. A. County Agencies	Public Works
Coordination with State Agencies	Chief Administrator Officer, Emergency Planning Division (CAO EPD)
Coordination with Federal Agencies	CAO EPD
Public Information & Education	Fire, Mayor
Damage Assessment	Building and Safety, Public Works
City Building Maintenance/Repair	General Services

Marie Sanderson, in her book “Prevailing Trade Winds, Weather and Climate in Hawaii” (1993), discusses the fact that all major droughts in Hawaii have coincided with El Nino events. The El Nino events of 1877-78, 1982-83, 1986-87, and 1991-92 all coincided with significant dry spells in Hawaii. Ms. Sanderson also discusses the factors that control climate; the radiation, energy, and water balances; the impact of climate on human activity; and the importance of the climate of Hawaii for scientific research. This research illustrates that the correlation of the climate in Hawaii can impact the western United States.

In a report written by this researcher (Seidel,1992,pp.1-7), he describes the damages that will occur during major flooding in the City of Los Angeles. He discusses predicted locations that will be effected by flooding and further gives statistical predictions for property damage, monetary damage, percentages of areas that will be flooded, and major roads and freeways that will be effected. In the arena of swift water rescue response teams, he describes the requirements

of deployment, staffing, response, rescue options, incident command, and disaster management (May 1994,pp.66-69).

This researcher further discusses mutual aid in the swift water rescue arena (1995,pp.33-36). In this article sample mutual aid agreements are provided and key components: equipment, training, communication, command responsibilities, resource allocation, operating guidelines, dispatch methods, response locations, and limitations are addressed. He discusses how these agreements provide benefits to all agencies, as well as an economical way to mitigate shared disasters.

In 1991, the United States Army Corps of Engineers, Los Angeles District Office conducted a feasibility review of the flood control system. This study describes the history of flooding within the Los Angeles area, predicting flooding in the future, and categorizing floods by rating storms due to their projected statistical frequency. Also, the effects of urbanization are discussed showing that concrete and asphalt prevent water from percolating into the ground, thus allowing flood control channels to reach peak volumes in short periods of time (USACE,1991,pp.22-28).

Jack Williams, in “The Weather Book” (1997), provides a scientifically accurate weather guide that focuses on the scientific community as they move into the 21st century. He does this through a discussion on how man is affecting the climate of earth, by specifically focusing on “wild weather” which include floods, El Nino, Tornadoes, hurricanes, thunderstorms, tropical storms, and the green house effect. This book contains scientific detail along with easy to follow graphic illustrations that support his discussions. He cites that in Big Thompson Canyon,

Colorado in July 1976, twelve inches of rain fell in just six hours. The results caused 139 people to lose their lives. He states that with today's modern weather prediction capabilities and the utilization of historical data, disasters such as this can be prevented.

PROCEDURES

The procedures utilized to arrive at the final results of this study included four distinct areas of concern: First, a thorough review of the available published literature relating to disaster management. Second, a comprehensive analysis of historical disaster data and statistical documentation of the El Nino Southern Oscillation Phenomenon. Third, evaluation of risk management prevention programs and computer assisted disaster programs to locate at risk areas. Fourth, effective means to communicate disaster risks, resistance, response, and recovery information to the community.

Definition of Terms

- **Alluvial Fans :** Are fan-shaped soil and rock deposits, which eroded from mountainsides and accumulate on the valley floors. These deposits are narrow and steep at the head of the valley and widen as they spread out into the valley.
- **Confluence:** Where two waterways merge together to form a single waterway.
- **El Nino:** Spanish for Christ Child. Due to the warming of ocean currents that occur approximately in a ten-year cycle from December to March. It is responsible for extremely heavy rains on the land.

- **Flood Control System:** A system designed to manage, convey, or store storm waters.
- **Fluctuating Lake Levels:** Can occur by both natural (rainfall, snowmelt, etc.) or man-made events (irrigation of crops, etc.).
- **Liquefaction:** A type of ground failure, which lowers the ground surface and causes flooding. This can occur in areas of high ground water, tides, storm surges, and over-the-bank stream/river flows.
- **Levee:** Is the most common type of flood control device designed to convey, store, and manage floodwaters. They can be made out of any materials capable of holding water.
- **Mutual Aid:** A beneficial agreement between two or more parties that is reciprocal, voluntary, and/or compensated by some means.
- **Reach:** A specific geographic section of the flood control system.
- **Swift Water Rescue Team:** A specially trained water rescue team able to mitigate rescues in moving water.

Collection of Data

The procedure used to collect the data analyzed in this research was obtained from published scientific literature, historical reports of documented disasters, and United States Army Corps of engineers flood inundation predictions. Also, interviews were conducted with twenty-three fire departments in California, who have resources capable of responding to flood disasters.

Assumptions and Limitations

The following assumptions and limitations should be noted prior to reading the results section of this report. An assumption must be made that the persons conducting historical disaster analysis utilized accurate data. A limitation must be included that computer analysis of El Nino predictions is new and still being evaluated for accuracy. The final assumption and limitation applies to the fact that no previous financial impact nor legal liabilities were addressed in this research.

RESULTS

The results of this research document the need for emergency service personnel to conduct disaster planning in the forms of risk analysis, resistance planning, response measures, and recovery efforts. What follows are the projects' research questions with the associated responses. The responses are the direct output of the literature review, statistical analysis, and historical documentation.

1. What can be expected in an El Nino?

El Nino derives its name from the Spanish term for the baby Jesus, used by Peruvian Fishermen because it was about Christmas time when they began noticing the weather pattern and finding warm-water fish in their fishing nets.

What actually occurs in an El Nino is the slackening of trade winds around the equator. This causes warm surface water that is normally pushed up against the western side to slide eastward. When this happens a chain reaction follows. Cool, nutrient-filled waters along the western coast of North and South America never rise to the surface, and marine life begins to die or is forced to migrate to other areas. As the plume of warm water spreads eastward, the currents of air that rise from warm water in effect suck the tradewinds back eastward even more. The rising moisture laden air breeds thunderstorms over the eastern Pacific Ocean. The reversal occurs on the western portion of the Pacific Ocean, where normal wind patterns depress the formation of thunderclouds that ordinarily dumps vast amounts of rain. This complex change in high level winds brings strong air streams 40,000 feet aloft whipping across Central America to the Atlantic and on towards Africa. These winds “shear off the tops of thunderclouds” before they can coalesce into a hurricane. What does this mean in layman’s terms: “It’s a push-me, pull-me affair.” Ocean temperatures drive winds; winds drive ocean currents; ocean currents redistribute heat over sea surfaces; and the new pattern of ocean temperatures drive the new winds. In reality, this means “strange weather” will occur (Groves,1989).

Meteorologists began noticing this summer that El Nino 1997 could be a big storm when one of the storm telltale signs – rising temperatures in the Pacific Ocean, more than six thousand

miles off the coast of Peru. Only this time, the temperatures have jumped by nine degrees, from 79° to 88° Fahrenheit. This is compared to the typical two-degree temperature rise in a normal El Nino year (Attachment C). Further fueling of this speculation that El Nino could be extreme is the oceanic heating that began in April 1997, whereas scientists usually see the effects of El Nino in September/October (Williams,1997).

In normal years, it is rare for a hurricane to reach California. But, this is not a normal year. On September 24, 1997, residents of California and Arizona held their breath as “Hurricane Nora” came aground in Mexico’s Baja Coast and continued its devastation north. By the time this 88 mile wide storm hit the coast its winds had lost velocity (180 miles per hour) and slowed to 54 miles an hour. However, this storm was still powerful enough to deluge Los Angeles. Homes in Seal Beach, an ocean community, were flooded when ten-foot surf crashed over the breakwaters, 400 traffic accidents were reported, 1,000 people were evacuated due to the storms potential, and three people succumbed from this storm. Scientists have predicted that Nora, was just a dress rehearsal for events to come this winter (Williams,1997).

Meteorologists utilize two methods of weather predicting, these are past historical events and computer technology. Computer technology is still new and programs are continually being updated and modified to increase accuracy and predictability capabilities. However, historical event usage has proven to be fairly accurate. Scientists are monitoring this El Nino season from the 1982/83 season. During that monster storm there was widespread destruction, 256 homes destroyed, hundreds of injuries, and thirty-three deaths. World wide that storm resulted in 1500 deaths and over \$8 billion in property damage (Groves,1989).

Already, this year El Nino is shaping up to be the biggest in history. The zone of warm water that is now off Peru (Appendix B) is already bigger than the entire continental United States. It stretches more than 6,000 miles, a quarter of the Earth's circumference, and is still growing.

Weather forecasters cannot predict the certainty of El Nino's arrival nor the strength of devastation that could occur. However, recent weather changes which have caused significant increases in temperature in a large portion of the Pacific Ocean are leading meteorologists to conclude that El Nino is on its way.

2. What "risks" must the City of Los Angeles include in its damage assessment?

By reviewing historical flood documentation, the City of Los Angeles has predicted a whole host of problems will occur. These include people trapped in structures and automobiles, people swept away due to flooding, hazardous materials washed into flood zones due to the inundation of industrial complexes, as well as other toxic materials from refineries, and the need to assist animals. Utility hazards will be present, structures will require evaluating as to stability, access will be restricted due to inaccessibility, and the sewer system will be drastically impacted. After effects will include getting food and water into inaccessible areas. Long lasting effects include those due to the standing water are mosquitoes, disease, and other waterborne pests.

In analyzing the Los Angeles Flood Control System, this researcher stated in a previous research project on Mutual Aid in the Swift Water Arena (July 12, 1993) that it is outdated. He also stated that it is inadequate to handle even a ten-year storm in the five reaches that encompass the City of Los Angeles. In a 50 or 100 year storm wholesale failure could occur. It is predicted

that El Nino 1997 could have a 100-year flooding. Congress has passed legislation to ease the permit issue over cleaning debris and vegetation from the flood control system. Seven years ago, construction was commenced in the Long Beach area to improve the flood protection by widening and heightening the flood control system. However, no improvements have been made in the flood control “reaches” in the City of Los Angeles.

The City of Los Angeles Flood Control System is composed of nine geographic sections. These geographic sections are called a “reach”. Within the City of Los Angeles, only four of the nine “reaches” have a direct bearing on flood hazards. In analyzing these nine “reaches” the United States Army Corps of Engineers have estimated that the following damage outlined in the below chart will occur. It is predicted that El Nino 1997 could have a 100-year flooding.

100 Year Flood Prediction in Los Angeles				
Destruction	Reach 1	Reach 2	Reach 3	Reach 4
Property Damage	3,605	1,272	700	58,248
Roads Damaged	8	7	10	8
Freeways Damaged	1	2	2	5
% of Area Flooded	2.0	1.8	1.7	38.5
Monetary Damage (\$Mil.)	101.9	19.7	67.1	1,685.4

In 1991, the United States Army Corps of Engineers, Los Angeles District Office conducted a feasibility review of the flood control system. This study describes the history of flooding within the Los Angeles area from 1862 to date. The study also predicts flooding in the future through categorization of floods. By rating storms due to their projected statistical frequency, i.e. 10-year, 25-year, 50-year, 100-year, and 500-year, engineers and meteorologists

can work in partnership to lessen nature's devastation on society. However, the effects of urbanization show that concrete and asphalt prevent water from percolating into the ground, thus allowing flood control channels to reach peak volumes in short periods of time. What this means is channels will overflow unless legislation is enacted to improve flood control systems.

As the above chart reflects the risk of flooding to Los Angeles will have a direct impact on the day-to-day operations within the City. The indirect effects will be felt for years after and in some cases recovery and restoration will never occur. By utilizing the flood inundation maps, evaluating historical documentation, and plotting predictions we can foresee areas of potential devastation. Thus, we can begin to prepare to resist the storm through preparation.

3. What steps can be taken to prepare for “resistance” to this disaster?

Within the County of Los Angeles, both the Los Angeles County Board of Supervisors and the Los Angeles City Council have directed all departments responsible for flood preparedness and mitigation to begin a state of readiness for this year's anticipated winter season. The lead departments in emergency management: Fire, police, chief administrative office, public works, transportation, recreation and parks, general services, building and safety, animal regulations, and the mayor's office are focusing on a unified approach.

This preparation to “resistance” and collaboration with other City agencies has been broken down by the fire department into six areas: Community awareness programs, media advisory, weather forecast monitoring, erosion control, training - community emergency response teams (CERT), and training - emergency response resources. The issues are detailed as follows:

Community Awareness Programs

The fire department's Fire Safety Education Unit has been working with the Emergency Operations Center and Department of Building and Safety on literature, public safety announcements, Internet access, and media advisories.

The fire department has the following pamphlets available:

“Don't Ignore the Need for Emergency Disaster Preparedness”

“Fuel Modification and Erosion Control”

“Preventing Damage from Mudslides”

“Disaster Preparedness Coloring Book” (for Children)

Also available to the City through the United States Fire Administration are the following pamphlets and books:

“Retrofitting Flood-prone Residential Structures” (FEMA:L-153/June1987)

“After a Flood: The First Steps” (FEMA:L-198/August1992)

“Emergency Preparedness Checklist” (FEMA:L-154/August1993)

“Reducing Losses in High Risk Flood Areas: Guidebook for Local Officials
(FEMA-116/February1987)

“Floodproofing Non-Residential Structures” (FEMA-102/May1986)

In anticipation of a severe winter the Los Angeles City Fire Department Fire Safety Education Unit has already begun training presentations to the community. These pamphlets are being presented to members of the community at meetings, seminars, and upon request. The department is in the process of updating its web page to include the above mentioned information on El Nino (Attachment D).

Media Advisory

The fire department has prepared a media advisory to alert the citizens to awareness materials, training availability, emergency resource capabilities, and other preparedness issue related to El Nino (Attachment E). Besides this media advisory and the aforementioned preparedness information, a single point for storm related information has been developed, where the public can obtain the latest menu-driven information source that will refer them to assist their need(s). The information is telephonically available by calling 1-888-EL-NINO 1, or by accessing the Internet at: www.pmel.noaa.gov/toga-tao/el-nino/home.html, or through e-mail access: dpierce@ucsd.edu.

Weather Forecast Monitoring

The fire department continues to participate in the Los Angeles Swift Water Committee, which works closely with the National Weather Bureau and the National Oceanic Atmospheric Administration (NOAA). Through this work group pre-water planning has been conducted of all waterways within the City, as well as a close relationship with the dam and flood control operators. Flood inundation maps have been updated to predict the possibility of damage, if the City was to receive a 10-year, 50 year, 100 year, or 500 year flood.

In the event of forecasted rain or severe storms the Los Angeles Fire Department's Operation Center is notified. With the prediction of ½" of rain in a 12 hour period in urban areas or a 1" of rain in a 12 hour period in mountain areas, at a 80% chance of prediction, emergency notifications, media advisories or alerts are broadcasted in preparation for the upcoming storm.

Erosion Control

In the area of erosion control the fire department will make available literature, sand bags at various fire stations, and location of sand to fill the bags. The department is working with the Bureau of Street Maintenance to have sand located at various areas within the City.

The fire department currently has 107,550 sandbags on hand located at 50 fire stations throughout the fire department's three divisions. As a part of the City's Emergency Operations Master Plan and Procedures for Storm Annex, the fire department has developed a primary and support roles with all other departments involved in flood preparedness.

Training – Community Emergency Response Teams

Community Emergency Response Teams were developed by the fire department as a means for citizens to assist themselves, businesses, or neighborhoods in the event of a natural disaster. These teams receive 88 hours of initial training followed by 4 hours of annual refresher training. The training curriculum covers emergency first aid, utility hazard recognition and rendering safe, fire hazard recognition and fire extinguisher training, organization and communication procedures, documentation, and use of the safety equipment issued. Notification of request for deployment is conducted through the amateur radio communications link.

These CERT teams can be predeployed to assist emergency rescue personnel in preparation for the storm or during the storm in the areas of erosion control. They can also be used to conduct damage assessment, first aid, and working in evacuation centers. To date, the fire department did initially train 16 teams, one in each battalion. They have also trained over 100 private and public industry teams.

In the area of community training the fire department is continuing to conduct CERT training. The fire department has just completed working with the Los Angeles Board of Education and film producer Nancy Riggs on updating the flood safety educational video “No Way Out”. This video has been used in the school system since 1992 to provide flood safety and education messages to our children and young adults in kindergarten through high school.

Training - Emergency Response Resources

The fire department continues its training in swift water rescue by conducting joint training exercises with our mutual aid agencies. Internal swift water rescue training has been given on three levels to all department personnel. These levels of training include first responder swift water rescue training, technical rescue training to members of the Swift Water Rescue Team, and incident command training to all chief officers.

The fire department is currently updating its training videos to include not only swift water rescue messages, but also add flood conditions, mudslides, and surf rescue awareness. Along with updating our departments video, a simultaneous video update will be done with the Los Angeles Police Department.

The fire department also attends the State’s Office of Emergency Services “Multi-Agency Swift Water Rescue Committee” meetings where efforts in preparation, education, and mitigation are viewed from the State level. Recently, the Committee has developed procedures to standardize the allocation of resources to flood disasters.

4. What measures need to be employed to “respond” to mitigate this disaster?

An effective operation during a major disaster depends upon a realistic plan of action in order to cope with the existing emergencies. Command level officers have the primary

responsibility for developing incident action plans for each operational period that encompass incident objectives, safety messages, communications, medical provisions, other agency interface, air recon/support, media releases, and human resource statements. These incident action plans will ensure optimum utilization of the resources under the control of the incident commander. During disasters, in addition to normal operational functions, command staff must accept the magnitude of possible deaths, injuries, property destruction, and failure to provide normal service functions. Therefore, these incident action plans must be all risk in design.

The incident action plans developed must cope with the immediate problems and related contingencies. Such plans should be predicated on the area of self-sufficiency, until additional resources are determined or available. This short-term plan (based on each operational period, which is usually 12 hours long) must be established on priorities and realistic objectives.

Developing a plan for operations, which will continue for an extended period of time, i.e. one to two weeks, must be considered since the overall operations of the fire service will be effected. Consideration must be given to the existing situation, potential problem development, operational limitation on logistical needs, human resources, etc. Long term plans need to be reviewed and updated as the situations change. It is necessary for executive management to liaison with all agencies involved in the synergistic mitigation of the disaster. These agencies should be involved in the planning phases, since they have a commitment in incident abatement and have advice on their resources capabilities and needs. This executive management team should also consider a “unified” command approach to handling the disaster should it involve multiple jurisdictions and transcend several geographical boundaries. Then the unified command team can provide a single point of safety messages, as well as media releases.

As mentioned, all Los Angeles Fire Department field personnel have received swift water first responder training. The department also has a 52 person Swift Water Rescue Team (SWRT) with personal watercraft (three person wave rider's), which are pre-deployed during inclement weather (80% prediction of 1/2" of rain in a 12-hour period). Mutual aid agreements dealing with swift water mitigation have been established with neighboring agencies (Burbank, Culver City, Glendale, and Los Angeles County). Countywide there are 17 Swift Water Rescue Teams and 8 Air Rescue Units available during inclement weather.

Within the State of California's Mutual Aid System, which the fire department participates in, Los Angeles has been designated as Region I. In Region 1 there are 110 fire agencies, of which there are 23 agencies with swift water rescue capabilities. The Office of Emergency Services (OES) has provided to the fire department a water rescue equipment cache with enough equipment and personal watercraft to support a 14 person rescue team. There are 9 other similar rescue teams in the State. Within Region 1, there are the Los Angeles City Fire Department, Los Angeles County Fire Department, Orange County Fire Department, San Diego Fire Department, and Riverside Fire Department. These resources and equipment caches are available through the State. In January 1996, the Los Angeles City Fire Department activated the OES SWRT and was deployed in Sacramento as a result of their flooding disaster. California is the only State to have specific swift water resources and equipment caches available.

On the Federal level, through the Federal Emergency Management Agency there are 27-sixty-two person Urban Search and Rescue Task Forces available. These Task Forces have water rescue capability as well as hazardous materials, search, shoring and cribbing, heavy rescue, and medical capabilities. This resource is available through the Federal Emergency Management Agency – Robert T. Stafford Emergency Disaster Relief Act.

The City of Los Angeles has done a comprehensive risk analysis, resistance planning to disaster preparedness, and has prepared for a synergistic response to mitigate this potential El Nino disaster. However, it must be noted and accepted that information regarding damage and life threatening incidents may take some time to receive, compile and provide an emergency response. Communications during any disaster becomes effected, due to the results of the disaster itself or overload from incident saturation. Fire departments must be able to accept incident communications from a myriad of means: telephones, fax machines, amateur radio communication links, television, radio network, or by persons reporting an incident. These communication links can provide valuable information on life threatening emergencies, pending collapse of structures, fires, potential levee and dam failures, impassable transportation routes, physical rescues, or evacuation needs. This information needs to be collated at a central point, where resources can then be dispatched. Priorities must be given to incidents receiving dispatches. The dispatch center must consider downgrading (degraded dispatch) the number or resources normally dispatched to a specific incident type, due to the disaster. This “degraded” dispatch will ensure resources remain available for life threatening emergencies. This procedure has been successfully utilized by the LAFD in disaster management.

Upon receipt of a reported swift water rescue incident the dispatch center receiving the alarm shall dispatch the mutually agreed upon resources necessary to combat the emergency. Jurisdictional notifications and mutual aid requests must be communicated through the dispatch center. This requires a command level person to be at the dispatch center to approve and authorize such requests. The amount and type of equipment needed to combat swift water rescue emergencies can be defined into two distinct areas: First responders who are trained to only provide low risk land based rescue options, and then specialized water rescue teams capable

of performing all rescue options including in-water rescues. These procedures are utilized by the LAFD and continue to illustrate the need for interagency cooperation in management of complicated emergencies and/or disasters.

The resources available at the scene of a swift water emergency can determine through the incident commander what rescue option is safe to perform. The minimum safe staffing for any rescue option is two personnel.

In the City of Los Angeles' Storm Annex, the Los Angeles City Fire Department has the responsibility to protect lives and property. This is accomplished by predeploying, responding, providing emergency supplies and information, and organizing City and mutual aid resources to abate storm-related incidents. The tasks used in organizing, minimizing, coordinating storm related resources are determined in the following table:

TASK	Resistance	Response	Recovery	Resource
Information gathering	*	*	*	BES, BSS
Enact Operational Plan	*	*		Chief / DDC
Review response plans	*	*	*	All personnel
Staff EOC	*	*	*	BSS
Activate Dept. Command	*	*		Chief /DDC
Disseminate info to Dept. & community	*	*	*	BES & BSS
Distribute Sandbags	*	*	*	BES & BSS
Publish list of where sandbags can be obtained	*	*	*	BSS
Order supplies	*	*	*	BSS
Top off fuel tanks	*			BSS

Predeploy Swift Water Rescue Teams	*	*		BES
Respond to Emergency Incidents		*		All Members
Coordinate Volunteers	*	*	*	BES & BSS
Recall members	*	*		BES
Establish Command Post & Base	*	*		BES/ BFP&PS
Helicopters use	*	*		BES
Cancel non-emergency activities	*	*		DDC
Command Staff Briefings – IAP	*	*	*	DDC
Mutual Aid Requests	*	*	*	Chief / DDC
Documentation	*	*	*	All Officers
Deactivate EOC			*	BSS
Implement Demobilization Plan		*	*	Chief / DDC
Debrief Staff			*	BSS
After Action Report			*	BES

BES – Bureau of Emergency Services

BSS – Bureau of Support Services

DDC – Deputy Department Commander

BFP&PS – Bureau of Fire Prevention and Public Safety

EOC – Emergency Operations Center

IAP – Incident Action Plan

This table illustrates what the fire departments role will be in disaster management. What must be appreciated is the fact the fire service does not and can not provide all the physical resources or operating expertise during a disaster. What is essential is a means of accessing needed equipment, expertise, and providing a resource registrar prior to the disaster. Through the City's infrasharing and preparation for disasters this registrar is in existence.

5. What “recovery” procedures need to be adopted?

With any emergency of disaster it is imperative to bring the situation under control as quickly as possible. This, of course, is fundamental to all emergency services. Having achieved this priority, recovery efforts become the next strategic target. In fact, recovery plans should commence once the disaster is declared. A definition of community recovery services are those by which individuals, families, businesses, and the community are assisted to regain an acceptable level of functioning, following a disaster through the provision of information, personal support, resources, specialist counseling, and medical/mental health services.

While it cannot be predicted the status of staffing resources needed to manage and respond to a disaster, careful requests in ordering resources, proper tracking of resources, and effective utilization of each resource aid in good disaster management. Management must also carry on these principles, by formulating plans to maintain response during the recovery phase. While the disaster is occurring and local resources have committed their resources, State and Federal resources can be deployed upon the receipt of a local disaster declaration . However, during the recovery phase the Federal Emergency Management Agency can and has in the past provided recovery assistance.

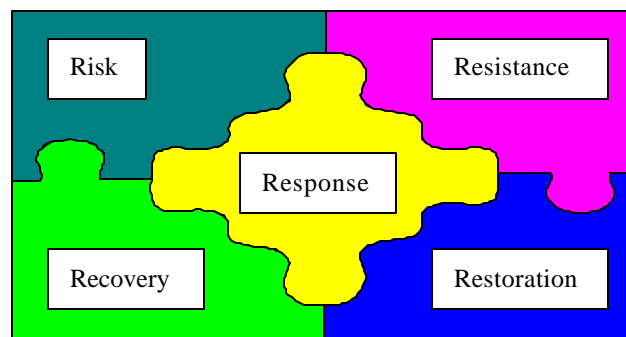
Recovery is the effort to restore the infrastructure, as well as the social-economical life of the community impacted. For the short term, recovery usually means bringing necessary lifeline systems: water, power, communications, transportation, sanitation, and sewage up too acceptable standards. This also means providing for basic human needs: food, clothing, and shelter. City government must also ensure societal needs: law, order, fire, health care, and counseling services are restored to acceptable means, in order to meet the needs of the community. Government must

demonstrate that the City does care and help is available. Once some stability is achieved, then the jurisdiction devastated can began recovery efforts for the long-term. Thus, the long-term objectives of the restoration phase for economical improvement and community rebuilding will be met.

DISCUSSION

The findings of the research indicated an urgent need to utilize the Los Angeles City Fire Department's and the City of Los Angeles' Emergency Operations Master Plan on Storm Annex procedures for flood mitigation in preparing for the potential effects of El Nino 1997. It is evident in this research that agencies within the County of Los Angeles have worked hard to maintain a high level of interdepartmental cooperation.

As stated by United States Senator Barbara Mikulski, Chair of the House Appropriations Committee, at the 1997 El Nino Summit Conference, "Disaster management must include all components, these are risk, resistance, response, and recovery." These four phases with the addition of the restoration phase ensure completeness to the mitigation of disaster puzzle.



At the El Nino Summit, held in Santa Monica on October 14, 1997, Vice President Gore spoke to the attendees on the vital need for emergency resource management. He asked local, State, and Federal agencies to develop partnerships, both public and private, in order to save lives, shelter people devastated by the disaster, and rebuild communities. He spoke of the need to prepare through analysis of flood plain maps, utilizing information available from the National Flood Insurance Program, and develop mitigation response procedures that include governmental agencies. Realizing that disaster management involves five phases (risk identification, resistance planning, response measures, recovery efforts, and community restoration) enables all agencies involved to work collectively together in preparation for this year's winter storm.

Over the 100-year history of the Los Angeles City Fire Department, there have been many disasters that have faced this department. They include: earthquakes, floods, riots, wildland fires, tornadoes, and now El Nino. Because no one knows what will happen during the coming storm season, the department must continue to dedicate its resources and personnel to prepare for the upcoming storm season and work with cities, the media, and the public to provide for the health and safety of the public.

The findings of this research indicated that throughout the Los Angeles area agencies have worked hard to maintain a high level of interdepartmental cooperation. Formalized mutual aid agreements and joint swiftwater rescue programs provide for a quick and efficient means to mitigate incidents synergistically. Through damage assessment and risk management prevention programs utilizing computer and historical data, flood inundation areas can be identified and pre-water planning implemented. In anticipation of a severe storm season, community preparation has become a top priority. These programs include community awareness, community emergency response team training, erosion control, media advisories, and weather forecast

monitoring. Continued inter and intra-agency disaster cooperation has proven itself to be a vital link in the recovery aspects of a City prone to disasters.



RECOMMENDATIONS

Due to the forecast predictions of “El Nino 1997” the Los Angeles City Fire Department has the potential for numerous incidents in fast moving flood water. To meet this end the LAFD has conducted a thorough evaluation of its swift water rescue response capabilities. Areas included were: pre-water planning, equipment purchases, dispatch criteria put in place, training of all personnel, communication plan, command responsibilities, mutual aid plans established, swift water rescue teams established.

In the resistance arena, education programs are in place throughout the Los Angeles County Board of Education, media warnings and advisories are established in the forms of public service announcements and press releases. CERT teams have been identified and they have been trained on their actions prior to and during the storm. Erosion control measures are in place for citizens and CERT teams prior to and during the storm.

In the risk analysis phase, flood inundation maps, flood insurance data, historical data have been compiled to predict the high-risk areas prone to flooding. Awareness programs have been made available to those homes, businesses, schools, and other property concerns in these flood prone areas. The National Weather Service, National Oceanic and Atmospheric Administration, Los Angeles Emergency Management Center, and Los Angeles City Fire Department are working with the media to broadcast pre-warning information surrounding El Nino.

This approach to the mitigation of flood incidents in our community has allowed the Los Angeles City Fire Department to remain proactive in their emergency management capabilities. In order to meet this challenge the following recommendations and commitment from all participating agencies have been adopted. “Other fire departments, especially those on the West Coast, should consider implementing the following recommendations:”

- Utilization of mutual aid agreements in swift water incidents.
- Obtain fire department training videos on swift water rescue measures.
- Include training law enforcement agencies in swift water training.
- All fire department members should thoroughly review lesson plans on swift water rescue.
- Implement a strong media campaign on awareness, education, and public safety announcements relating to El Nino 1997.
- Conduct joint training exercises with all agencies involved in swift water rescue.
- Consider pre-deployment of swift water rescue teams in the event of potential heavy rains.

- Maintain current and updated resource lists (sandbags, sand, high profile vehicles, CERT team members, educational literature, etc.)
- Keep liaison efforts with all agencies involved in storm management.

Remember, when a disaster occurs, no single agency has the total resources to cope with the enormity of the problem. The principle functions of any emergency service following a disaster are the availability and adequacy of resources, mutual aid, efficient and effective coordination, and inter and intra-agency cooperation. In isolation all emergency services are geared to effectively handle their particular area of responsibility, however following a disaster, many factors can impact on any and all functions of emergency services. While emergency services generally “expect the unexpected” during response, when dealing with disaster situations, the attitude, response approach and actions must be focused for the worst case scenario.

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Appendix A

Los Angeles Flood Control System Map

Appendix B

Los Angeles Flood Inundation Map

PACIFIC
OCEAN

SAN
MONICA
BAY

LEGEND

LAGO SYSTEM (ORIGINAL ENTRENCHED)

LAGO SYSTEM (CHANNEL LEVEED)

100 YEAR FLOOD

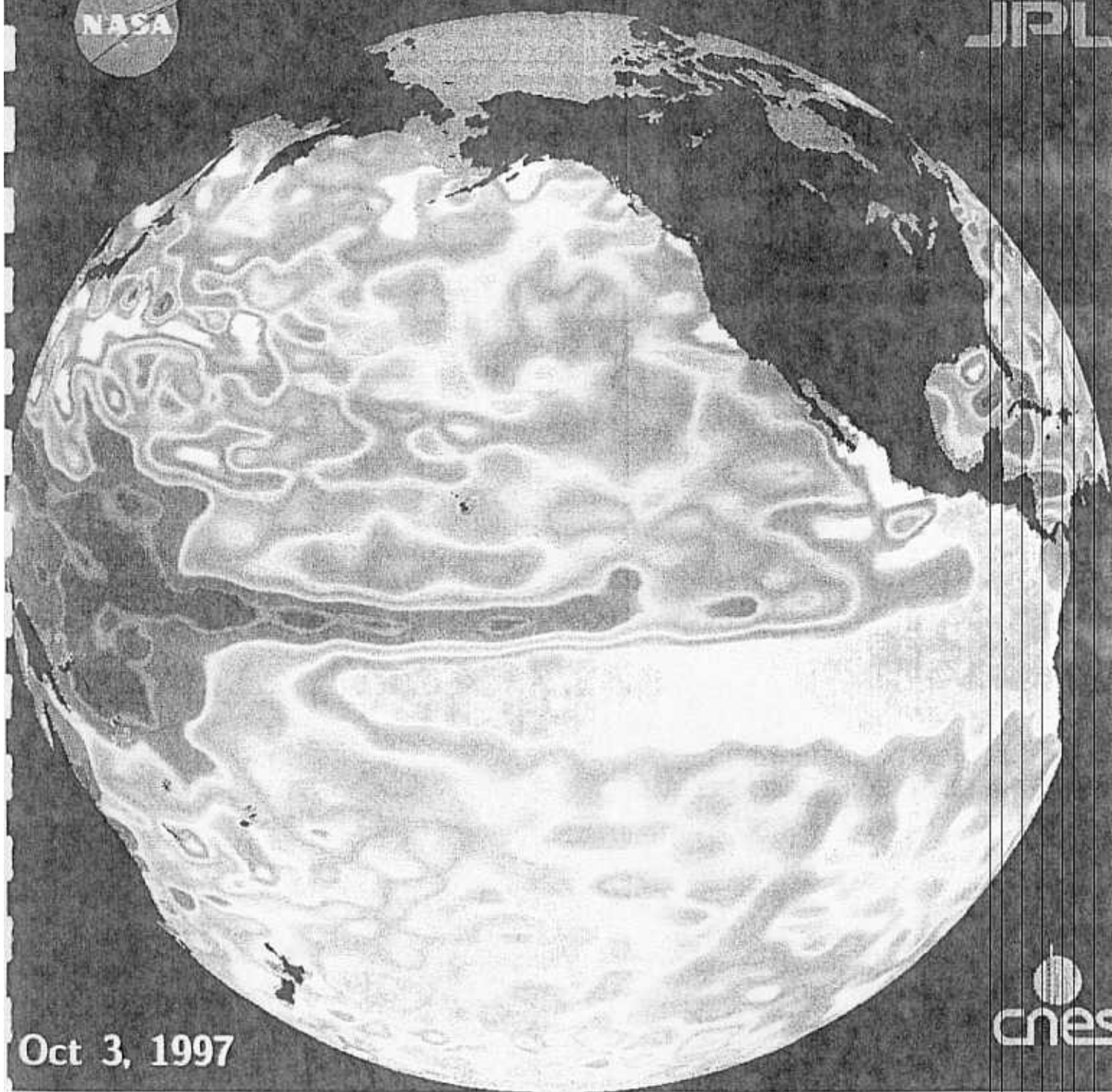
500 YEAR FLOOD

Appendix C

El Nino Weather Prediction



JPL



Oct 3, 1997



INNOVATION

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A normal year

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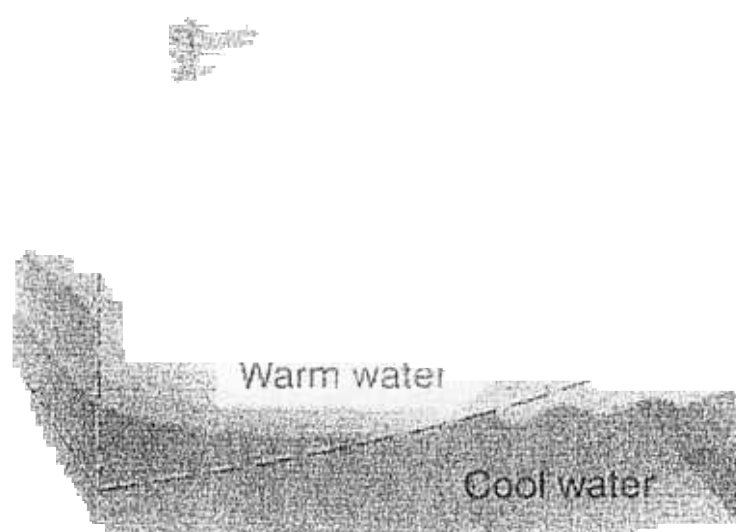
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Appendix D

Sample Community Preparedness Literature



Steps To Reduce Damage and Loss from and Prepare for El Niño

A particularly severe weather pattern, known as El Niño, has been predicted for this winter. This is expected to bring a series of weather changes throughout the United States including flooding, hurricanes, droughts, severe snowstorms, etc. While these are only predictions, FEMA believes it is important that businesses, communities and individuals take the necessary steps to prevent damage to life and property and to prepare before severe weather strikes.

Prevention Tips

**FEMA recommends individuals take the following steps
to help prevent damage and loss:**

To Reduce Your Risk From Floods...

- ▶ Move valuables and appliances out of the basement of your home or business if it is prone to flooding. By doing so, you increase the chance that your belongings will be safe and sound when a flood event occurs.
- ▶ Elevate the main breaker or fuse box and the utility meters above the anticipated flood level in your home or business, so that floodwater won't damage your utilities.
- ▶ Buy flood insurance to cover the value of your home and its contents. Not only will insurance give you greater peace of mind, but it will also greatly speed your recovery if a flood occurs. To learn more about insurance, call 1-800-638-6620, or contact your local insurance agent.

To Reduce Your Risk From Wind Events.

- ▶ Have hurricane straps installed in your home or business to better secure the roof to the walls and foundation. This will reduce the risk of losing your roof to high winds.
- ▶ Install and maintain storm shutters over all exposed windows and glass surfaces, and use them when severe weather threatens. Besides protecting against wind, shutters also prevent damage from flying debris.
- ▶ Have your home inspected by a building professional to ensure that roof and other building components are capable of withstanding wind effects.

To Reduce Your Risk From Wildfire Events.

- ▶ Move shrubs and other landscaping away from the sides of your home or deck. All too often, homes burn when plantings around them catch fire.



October 1997

**Steps To Reduce
Damage and Loss from
and Prepare for El Niño**

A particularly severe weather pattern, known as El Niño, has been predicted for this winter. This is expected to bring a series of weather changes throughout the United States including flooding, hurricanes, droughts, severe snowstorms, etc. While these are only predictions, FEMA believes it is important that businesses, communities and individuals take the necessary steps to prevent damage to life and property and to prepare before severe weather strikes.

Prevention Tips

**FEMA recommends businesses take the following steps
to help prevent damage and loss:**

- ▶ Identify what potential risks could affect your business during severe weather. Are you near a floodplain? Is your business located where there have been droughts in the past?
- ▶ Develop business interruption plans and implement mitigation to minimize loss of jobs and business activity. Know which employees will be unavailable to work in times of crisis because of other obligations - children, parents, etc. Have a back-up business location. Keep up-to-date emergency phone numbers for employees.
- ▶ Purchase applicable insurance and know your assets. Standard insurance does NOT include earthquake or flood insurance. Contact your business insurance agent to ensure your business is covered for all risks. If your business is located in a flood-prone area - purchase flood insurance. Take inventory and videotape interior, exterior, etc.
- ▶ Line up alternate vendors for essential supplies and equipment. Have back-up equipment and know its availability. Sign contracts on these items if necessary to avoid last-minute rushes.
- ▶ Contact your state or local emergency management office or building official, or a FEMA Regional office for more information on protecting your business through mitigation.
- ▶ Encourage local community prevention efforts that reduce the risk to critical local infrastructures like electricity, water, and roads that are necessary for the continued operation of your business.
- ▶ Promote awareness of hazard risk and mitigation solutions among your employees, customers and the public.



October 1997

Steps To Reduce Damage and Loss from and Prepare for El Niño

A particularly severe weather pattern, known as El Niño, has been predicted for this winter. This is expected to bring a series of weather changes throughout the United States including flooding, hurricanes, droughts, severe snowstorms, etc. While these are only predictions, FEMA believes it is important that businesses, communities and individuals take the necessary steps to prevent damage to life and property and to prepare before severe weather strikes.

Prevention Tips

**FEMA recommends communities take the following steps
to help prevent damage and loss:**

- Remove all debris from in and around culverts and local streams and channels to allow the free flow of potential floodwaters in the culverts.
- Ensure the safety or redundancy of critical public records. Remove vital records from basement storage areas.
- Adopt policies now that will ensure that if flood destruction does occur community redevelopment plans and actions will minimize future flood losses. Predetermine mitigation priorities for post disaster development.
- In urban wildfire risk areas, trim or remove brush that is located close to schools, libraries, hospitals or any other public buildings. Replace with brush that resists or retards fires where possible.
- Use an existing or establish a new coalition of the public and private sectors to orchestrate a community disaster mitigation day. Partner with hardware stores, nurseries, volunteer groups, businesses, banks, insurance companies and others to carry out risk reduction actions.
- States and local governments should be proactively informing residents of areas protected by levees that flood insurance is a wise and available investment; also, state and local governments should coordinate insurance awareness campaigns in the most vulnerable areas.

Preparedness Tips

**FEMA recommends communities take the following steps
to prepare for El Niño:**

- Local elected officials and emergency managers should fully understand the procedures for obtaining State and Federal assistance in the event of an emergency.

Appendix E

Sample Media Press Release

The
City Of
Los Angeles



FIRE DEPARTMENT

MEDIA ADVISORY

WILLIAM R. BAMATTRE, Chief Engineer and General Manager

COMMUNITY SERVICE UNIT
200 NORTH MAIN STREET
LOS ANGELES, CA 90012

PRESS CONTACT: LEONARD C. THOMPSON, CAPTAIN II
PUBLIC INFORMATION OFFICER
(213) 485-6008

EL NINO

The Los Angeles City Fire Department has been informed by the U.S. Weather Service that the El Nino effect will produce a much greater than usual rainfall, with severe winter conditions in the Los Angeles and Southern California area. In response and preparation to this potential challenging situation, the LAFD has implemented the following:

LOCAL RESOURCES

- The LAFD has a 48 member Swift Water Rescue Team (SWRT) with Personal Watercraft (PWC) which will be predeployed on high hazard days (1/2" of rain in 12-hour period).
- Mutual aid-agreement for Swift Water Response is in place with neighboring agencies (Glendale and Los Angeles County).

Countywide resources available for mutual aid include 17 SWRT and 8 Air Units.

STATE RESOURCES

Region One has 110 agencies with 23 of these agencies with Swift Water capabilities.

- Office Emergency Services (OES) has provided the Fire Department a Water Rescue Equipment cache with enough equipment and PWC to support a 14-member rescue team. There are nine others in the State; Region One has them located at the Los Angeles City Fire Department, Los Angeles County Fire Department, Orange County Fire Department, San Diego Fire Department and Riverside Fire Department. These caches, each with a 14-member water rescue team, are available through the State. The Los Angeles Fire Department went to Northern California in January of this year on this type of request.
- There are twenty-seven 62-member Urban Search and Rescue Task Forces available through FEMA. Some have water rescue capability.

Winter storms in Southern California can be deadly, causing flooding, flash floods, high coastal surf, mudslides, snowstorms and avalanches. Wherever you live or travel, you should be aware of the dangers of a winter storm and be prepared to cope with one.

In anticipation of a severe winter it is recommended:

Winterize your home now!

- Repair roofleaks
- Fix broken windows and doors.
- Weather-strip doors and windows.
- Have emergency building materials handy for emergency weatherproofing.

Take erosion control precautions now on hillsides prone to slipping or mudslides

- Use landscape netting/sandbags/plastic.

As in preparation of all emergencies/disasters, store supplies at work, home and car in sealed waterproof container including:

- First aid supplies, medicines, food, water, portable radio, flashlight, spare batteries, spare clothing, and rain gear.
- Have out-of-state emergency contacts for your family.
- Know safe routes from your home or office to high safe ground.
- Have a safe meeting place for family members.

When you receive a storm warning:

- If flooding is likely, and time permits, move valuable household possessions to the upper floors of your home or office.
- If advised to leave your home, move to a safe area before access is cut off by floodwaters.
- Before leaving, if time permits, turn off electrical circuits at the fuse panel and shut off gas service at the main valve.

During the storm:

- Avoid areas that are prone to sudden flooding.
- Do not try to walk across streams or roadways that are flooded.
- Do not try to drive across streams or roadways that are flooded.
- Do not sightsee in flooded areas.
- Avoid unnecessary trips. If you must travel during the storm, dress appropriately and advise others of your destination and duration of your trip.
- Tune your local radio or television stations for emergency information and instructions.

After the storm:

- Don't turn the gas or electricity back on in your home; rely on utility crews.
- Don't use fresh foods or canned foods that have come in contact with flood waters.
- Follow instructions regarding the safety of drinking water. If in doubt, boil or purify water before drinking.
- Avoid disaster areas; your presence could hamper rescue or relief operations.
- Don't handle electrical equipment in wet areas. If electrical equipment or appliances have been in contact with water, have them checked before use.
- Avoid downed power lines and broken gas lines; report them immediately to the fire or police department.
- Use flashlights-not lanterns, matches or candles- to examine buildings; flammables may be inside.

The Los Angeles City Fire Department, through its Community Preparedness Programs and their Fire Safety Education Unity, has the following information available upon request:

PAMPHLETS

- "Don't Ignore the Need for Emergency Preparedness"
- "Fuel Modifications and Erosion Control"
- "Preventing Damage from Mudslides"
- "Disaster Preparedness Coloring Book" (for children)

This above information is available upon request.

Training in emergency preparedness for all types of emergencies are available upon request to community groups, businesses, industries, schools and churches as well as special needs individuals.

(In anticipation of a severe winter; these pamphlets, brochures, and training are already being presented to the community.)